AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A computer ~~-implemented~~, as controlled to implement a method of increasing efficiency in executing a matrix operation that uses matrix data in a standard format, said standard format comprising one of a column major format and a row major format, said method comprising:

for ~~a~~ matrix ~~A~~ data stored in said standard format, wherein said matrix data comprises data of any of a complete matrix, a complete submatrix, or a part of a matrix or submatrix, separating said matrix ~~A~~ data into blocks of data, each said block having a size p-by-q; and

~~at least one of:~~

~~storing elements in at least one of said blocks in at least one of a cache and a memory in a format in which elements of said block occupy a location different from an original location in said block; and~~

~~storing said blocks of size p-by-q in said at least one of cache and memory in a format in which at least one said block occupies a position different relative to its original position in said matrix A~~

rearranging and placing in a storage of said computer, for retrieval for executing said matrix operation, said blocks of data to be contiguous blocks of contiguous data such that said matrix data is represented in a nonstandard format that permits said matrix data to be moved from said storage into a position for performing said matrix operation more quickly than if said matrix data had been moved as stored in said standard format.

2. (Currently amended) The ~~method~~ computer of ~~claim 1~~ claim 22, ~~further comprising:~~ wherein said co-processing unit comprises a floating point unit (FPU) and said loading said matrix data into said set of data registers comprises loading said blocks from said ~~memory~~

storage into a ~~first series~~ subset of data registers in said set of data registers, ~~so that a format of data in said data registers comprises variations of an~~ using a deviation from a normal ~~optimal~~ floating point loading instruction of ~~a~~ the floating point unit (FPU) of the computer.

3. (Canceled)

4. (Currently amended) The ~~method~~ computer of claim 1, wherein said size p-by-q comprises a 2-by-2 block.

5. (Currently amended) The ~~method~~ computer of claim 2, wherein said ~~variations of an optimal~~ deviation from normal floating point loading ~~comprising~~ comprises a crisscrossing of elements about a diagonal of said blocks.

6. (Currently amended) The ~~method~~ computer of claim 2, ~~wherein said matrix operation comprises a linear algebra operation,~~ said method further comprising:

selectively, at least one of loading input data and storing a result of said ~~linear algebra~~ matrix operation into or out of said co-processing unit from ~~into one of a second set of data registers and a cache memory unit~~ L1 cache or memory by at least one of a subset of optimal load and store instructions, said loading and storing ~~a result~~ being dictated by an optimal FPU loading or storage instruction.

7. (Currently amended) The ~~method~~ computer of claim 2, wherein said ~~variations~~ deviation of ~~an~~ said normal ~~optimal~~ floating point loading instruction, in combination with said ~~storing said blocks in a different position~~ nonstandard format, provides a result ~~that~~ data of a transpose of said matrix ~~A resides~~ data to reside in said data registers of said FPU.

8. (Currently amended) The ~~method~~ computer of claim 2, wherein said loading comprises a ~~checkerboard~~ 2 x 2 crisscrossing technique.

9. (Currently amended) The ~~method~~ computer of claim 6, wherein said linear algebra operation comprises ~~an LAPACK~~ one of a BLAS kernel and a factorization kernel.

10-16. (Canceled)

17. (Currently amended) A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of storing information of a matrix in a register block data format, said method comprising:

receiving data for a matrix ~~A~~, said data comprising one of a complete matrix data, a complete submatrix data, and a partial matrix or submatrix data, said matrix data being stored in one of a standard column format and a standard row format;

dividing said matrix ~~A~~ data into blocks, each said block having a size p-by-q; and

at least one of:

storing elements in at least one of said blocks in at least one of a cache and a memory in a format in which is elements of said block occupy a location different from an original location in said block

storing said blocks of size p-by-q in a memory in a format in which at least one said block occupies a position different from its original position in said matrix ~~A~~,

said register data block format converting the matrix data to no longer be in either of said standard column format or said standard row format.

18. (Currently amended) The signal-bearing medium of claim 17, said method further comprising:

loading said blocks from said memory into a plurality of data registers so that a format of data in said data registers comprises a transpose data of said matrix ~~A~~.

19. (Currently amended) The signal-bearing medium of claim 18, wherein said loading comprises a loading using a ~~checkerboard~~ 2 x 2 crisscrossing technique.

20. (Canceled)

21. (New) The computer of claim 1, wherein said matrix operation is executed on a co-processing unit of said computer and said position for performing said matrix operation comprises a set of data registers of said co-processing unit, said method further comprising:

retrieving said matrix data from said storage in said nonstandard format; and

loading said matrix data into at least a subset of said set of data registers in an optimal format, said optimal format comprising a format of said matrix data in said data registers such that a minimal possible time is required to utilize said matrix data in said data registers in said matrix operation in said co-processing unit.

22. (New) The computer of claim 21, wherein said computer includes at least one of a machine architecture and an instruction set having one or more features that are less than optimal for executing said matrix operation, and said nonstandard format of matrix data and said optimal format in said data registers together provide a mechanism that overcomes said one or more features that are less than optimal for executing said matrix operation.

23. (New) A computer configured to implement a method of increasing efficiency in executing a matrix operation that uses matrix data in a standard format, said standard format comprising one of a column major format and a row major format, said method comprising:

converting at least a part of said matrix data into a pseudo matrix format comprising contiguous data that no longer represents said matrix data in said standard format, each pseudo matrix comprising a subset of said matrix data that is predetermined to permit a loading of said pseudo matrix data into a processing unit in an optimal format to perform said matrix operation, said optimal format comprising a format that allows a minimal possible time in said processing unit to utilize said matrix data in said matrix operation.

24. (New) The computer of claim 23, said method further comprising successively loading elements of each said pseudo matrix into said processing unit for executing said matrix operation, wherein said loading comprises successively placing data of each said pseudo matrix into predetermined registers of a register set of said processor in said optimal format.

25. (New) The computer of claim 24, said method further comprising:

processing said matrix operation on said data in said optimal format, a result of said processing being stored in predetermined registers of said register set; and

storing said result from said predetermined registers of said register set into memory in said pseudo matrix format.

26. (New) A computer having at least one of a machine architecture and an instruction set having one or more features that are less than optimal for executing a matrix operation, said computer configured to implement a method of overcoming said disadvantage, said method comprising:

rearranging at least a part of matrix data to be used in said matrix operation into a plurality of blocks, each block having size p-by-q, such that said matrix data is no longer stored in a standard matrix format comprising one of a row major format and a column major format, said rearranged matrix data in said blocks being stored as contiguous blocks of contiguous data in a nonstandard format,

wherein said nonstandard format of said matrix data is predetermined to allow said matrix data to be placed into a processing unit for processing said matrix data in said matrix operation such that said disadvantage on said computer is overcome.

27. (New) The computer of claim 26, said method further comprising:

loading said matrix data in said nonstandard format into at least a subset of data registers of said processing unit in an optimal format, said optimal format comprising a format allowing a minimal possible time in said processing unit to utilize said matrix data in said matrix operation.

28. (New) A computer configured to implement a method of overcoming a hardware disadvantage on said computer relative to a specific processing on a specific computer architecture/set of instructions, said method comprising:

using first software instructions to preliminarily process input data to be used in said specific processing on said specific computer architecture/set of instructions in a manner to generate a first error relative to said specific processing; and

using second software instructions to subsequently process said input data in a manner to generate a correcting error relative to said specific processing,

wherein first software instructions in combination with said second software instructions overcome said disadvantage.

29. (New) The computer of claim 30, wherein said specific processing comprises a matrix operation and said first error comprises storing matrix data in a format that converts matrix data from a standard column major or row major format into a nonstandard format predetermined to overcome said disadvantage when said data is subjected to said correcting error.